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PART IX

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

■

AUTOMOTIVE FUEL ECONOMY PROGRAM

First Annual Report to Congress, January 1977

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

AUTOMOTIVE FUEL ECONOMY PROGRAM

Report to Congress

JANUARY 11, 1977.

The attached document, "Automotive Fuel Economy Program First Annual Report to the Congress," has been prepared pursuant to Section 402(a)(2) of the Motor Vehicle Information and Cost Savings Act (Pub. L. 92–513), as amended by the Energy Policy and Conservation Act (Pub. L. 94–163), which requires in pertinent part that

> Not later than January 15 of each year, beginning in 1977, the Secretary shall transmit to each House of Congress, and publish in the FEDERAL REGISTER a review of average fuel economy standards under this part.

JOHN SNOW,
Administrator.

JANUARY 5, 1977.

Hon. JAMES O. EASTLAND,
President pro tempore of the Senate,
Washington, D.C. 20510

DEAR SENATOR EASTLAND: Transmitted herewith is the first annual report to the Congress reviewing the progress made in formulating average automotive fuel economy standards, as required by Section 502 (a)(2) of the Energy Policy and Conservation Act (P.L. 94–163).

Respectfully,

WILLIAM T. COLEMAN, Jr.

JANUARY 5, 1977.

Hon. THOMAS P. O'NEILL,
Speaker of the House of Representatives,
Washington, D.C. 20515

DEAR MR. SPEAKER: Transmitted herewith is the first annual report to the Congress reviewing the progress made in formulating average automotive fuel economy standards, as required by Section 502 (a)(2) of the Energy Policy and Conservation Act (P.L. 94–163).

Respectfully,

WILLIAM T. COLEMAN, Jr.

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Section 1

SUMMARY

This report reviews the progress made by the Department of Transportation, National Highway Traffic Safety Administration (NHTSA), in the area of automotive fuel economy, following the passage of the Energy Policy and Conservation Act (EPCA; P.L. 94-163), which adds a new Title V to the Motor Vehicle Information and Cost Savings Act. Section 502(a)(2) of EPCA requires that an Annual Report be submitted to the Congress and published in the Federal Register by January 15, beginning in 1977. The Annual Report of 1979 is to include a comprehensive analysis of the automotive fuel economy program. Since passage of the Act, NHTSA has taken the following actions in implementing the requirements of Sections 501-509:

1. Established the Office of Automotive Fuel Economy reporting directly to the Administrator of NHTSA.

2. Organized personnel, tasks, and resources to begin the preparation of Notices of Proposed Rulemaking (NPRM) and implementation of administrative regulatory processes.

3. Established the mechanism for interagency coordination.

4. Published in the Federal Register:

   (a) Advance Notice of Proposed Rulemaking (ANPRM) for establishing fuel economy standards for passenger automobiles for model years 1981-1984.

   (b) NPRM for applications from industry for reducing passenger automobile standards for model years 1978-1980.

   (c) NPRM for fuel economy standards on nonpassenger automobiles for model year 1979.

   (d) NPRM for exemption applications for low-volume manufacturers.

(e) NPRM for classifying passenger, nonpassenger, and off-highway vehicles.

5. Produced drafts for:

(a) NPRM for establishing which manufacturer of a multistage vehicle is responsible for compliance.

(b) NPRM for automobile manufacturers' reports.

6. Established a research and development program in support of specific rulemaking actions, utilizing resources and facilities of both the Department of Transportation and outside contractors.

Section 2

BACKGROUND

The Energy Policy and Conservation Act (EPCA), P. L. 94-163, enacted December 22, 1975, amends the Motor Vehicle Information and Cost Savings Act (15 U. S. C. 2001 et seq.) to include a new Title V - "Improving Automotive Efficiency." This Title requires the Secretary of Transportation to define and implement a program for improving the fuel economy of new automobiles in the United States market.

To satisfy this EPCA requirement, the Department of Transportation (DOT) started work on the procedural and regulatory elements of a fuel economy program. Initial planning began with the formation of a working group with automotive fuel economy experience from the Office of the Secretary (Systems Development and Technology and Transportation Systems Center) and from the National Highway Traffic Safety Administration (NHTSA) to provide the technical, legal, and administrative support to carry out the functions required by the Act. The focus of this work was on preliminary development of Notices of Proposed Rulemaking (NPRM's), procedures, and administrative processes so that an overall implementation plan was produced. The process of interagency coordination, on regulations that have significant policy impact, was established. Finally, the DOT staffing, resources, organization, and R&D activities to support the specific rulemaking tasks were identified.

In May 1976, letters were sent to the House and Senate Appropriations Subcommittees, advising them that up to $1.7 million would be used for automotive fuel economy activities during fiscal year (FY) 1976 and the FY 1976 Transition Quarter (FY 1976 TQ). These funds were appropriated to the Office of the Secretary and made available by transferring priorities.

On June 22, 1976, authority to administer the program was delegated by the Secretary of Transportation to the Administrator of NHTSA, (Federal Register; 41 FR 25015). NHTSA's responsibilities under the Act can be divided into four major areas: (1) to establish and enforce automotive fuel economy standards, (2) to grant exemptions from applicable fuel economy standards, (3) to receive reports from automobile manufacturers, and (4) to report to the Congress on the fuel economy program.

This first report to the Congress reviews the progress of the NHTSA Office of Automotive Fuel Economy in developing automotive fuel economy standards for new passenger automobiles beginning with model year (MY) 1978, and for nonpassenger vehicles beginning with MY 1979.

Section 3

INTRODUCTION

Over the twenty years between 1955 and 1975, United States dependence on imported crude oil more than doubled (see Figure 1). Preliminary 1976 data show another 10 percent increase - with imports now amounting to about 43 percent of the Nation's total petroleum supply requirements. Long-range projections show that, if present consumption trends continue, domestic and world sources combined will be unable to meet the expected United States demand for petroleum. Figure 2, which projects sources and consumption of this commodity to the year 2025, illustrates the increasing gap between supply and demand. (The curves shown would vary somewhat with price fluctuations, since price has a demonstrated relationship to demand.)

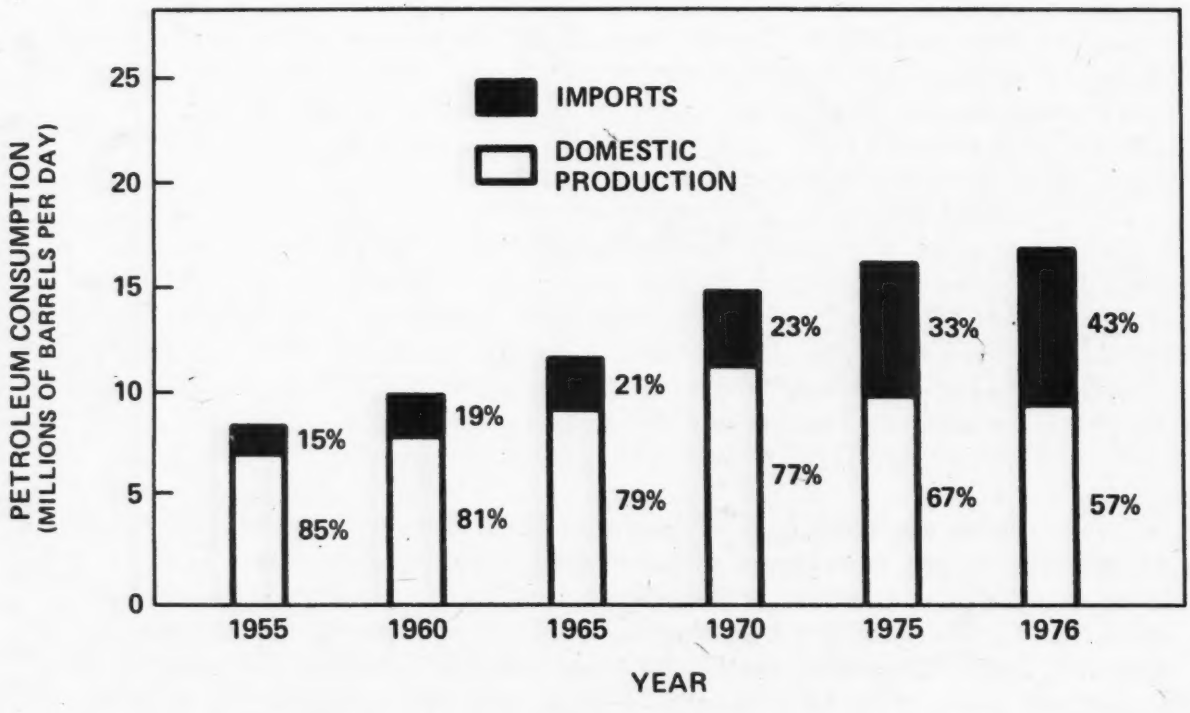
Transportation accounts for more than half of the United States petroleum consumption (see Figure 3); of this, 60 percent is used by automobiles. The daily average amount of motor fuel used in all United States vehicles for 1974, 1975, and the first nine months of 1976 is shown in Figure 4. The Federal Highway Administration (FHWA) estimates the rate of increase in gasoline consumption for 1976 at 5.7 percent, more than twice that recorded in 1975.

The urgent need for fuel economy in the automotive sector has been recognized by the passage of P.L. 94-163, the Energy Policy and Conservation Act (EPCA). This Act specifies the fleet average fuel economy standards to be met by automobile manufacturers, beginning with MY 1978. Figure 5 shows the fleet average fuel economy for passenger cars of model years 1974-1977, and the standards to be met under the EPCA from MY 1978 to MY 1985.

The fuel economy standard for MY 1978 passenger automobiles is set at 18 MPG, for MY 1979 at 19 MPG, and for MY 1980 at 20 MPG. The standards for MY 1981-1984 are to be determined by the Secretary and prescribed not later than July 1, 1977. The goal for MY 1985 and thereafter is 27.5 MPG, but this may be amended by the Secretary to a level which he determines to be the maximum feasible average fuel economy level. However, any change which increases the level above 27.5 MPG or below 26 MPG must be submitted to the Congress for approval. The standards for nonpassenger automobiles beginning in MY 1979 are to be determined by the Secretary. Fuel economy for

Figure 1

U.S. PETROLEUM CONSUMPTION, BY SOURCE (1955-1976)



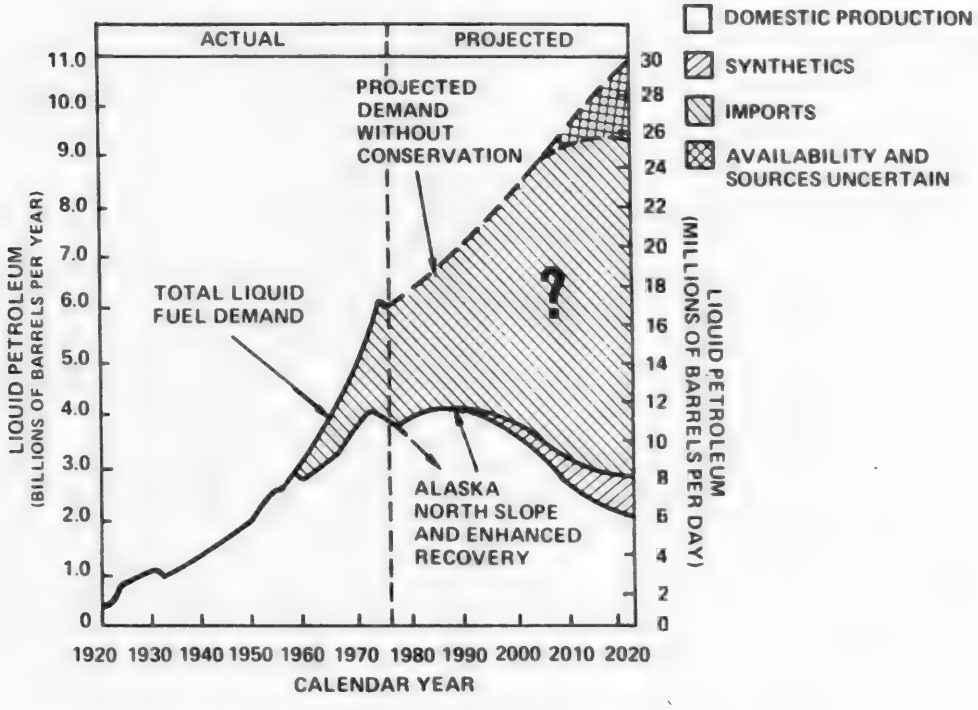
SOURCE: For '55-'70: National Energy Outlook, FEA (Pg. 57. Fig. II-6)

For '75: Energy Statistics, FEA

For '76: NHTSA Estimate

Figure 2

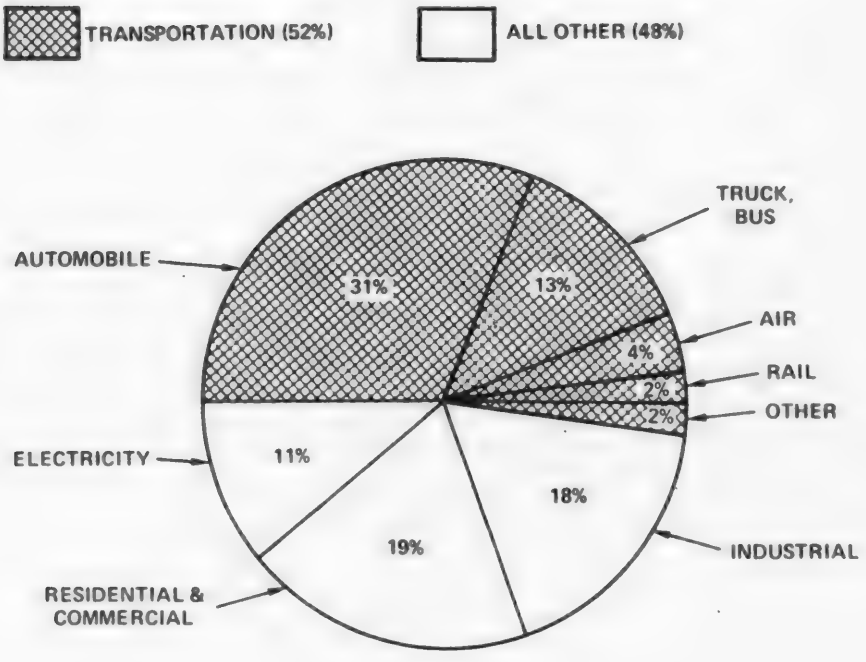
U.S. PETROLEUM CONSUMPTION AND SOURCES, 1920-2025



SOURCES: Historic Data:
1920 to 1963 Energy Facts
1964 to 1973 Annual Statistical Review, Petroleum Industry Statistics
1973 to 1975 FEA, Monthly Energy Review
Projected Data:
Synfuel Interagency Task Force, Vol. II (Nov. 1975), p. 67, Figure 4-111-10, "High SynFuels Cost" case adjusted to include 2 million barrels per day

Figure 3

U.S. PETROLEUM CONSUMPTION BY SECTOR



Source: Draft report by the Federal Task Force on Motor Vehicle Goals Beyond 1980. May 1976.

Figure 4

GASOLINE CONSUMPTION REPORTED BY STATES (1974-1976)

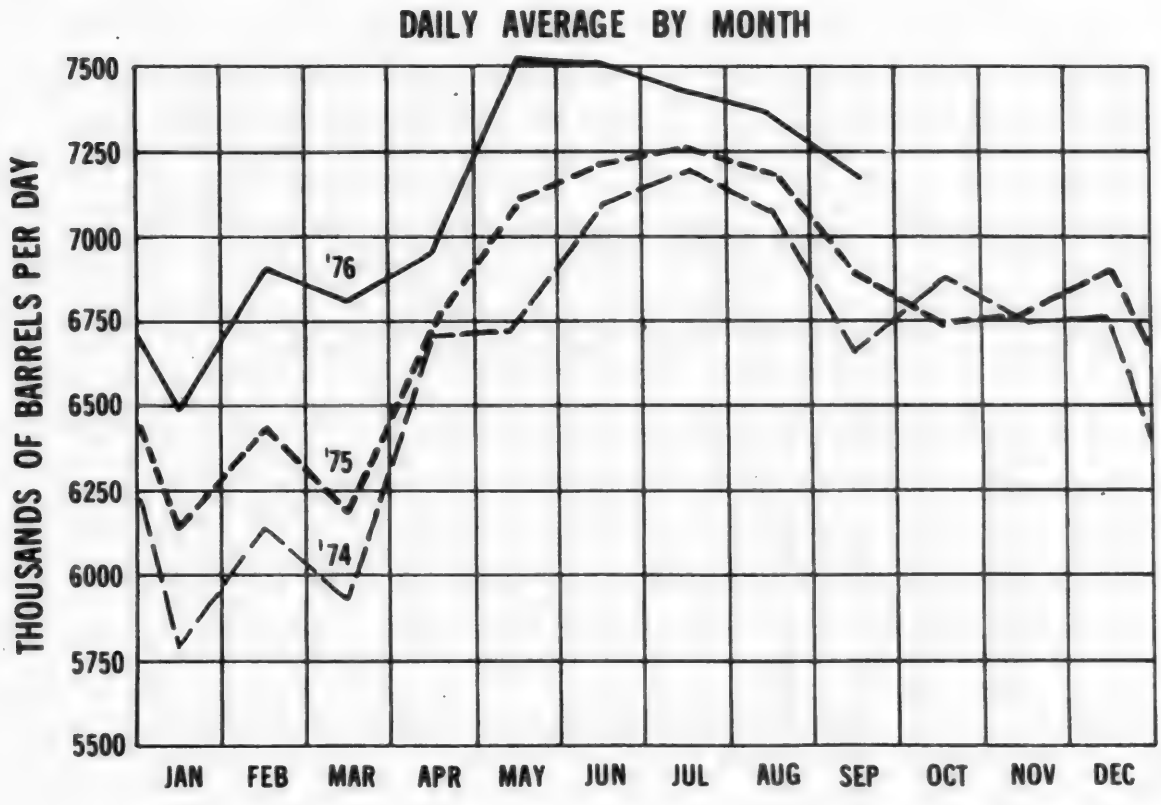
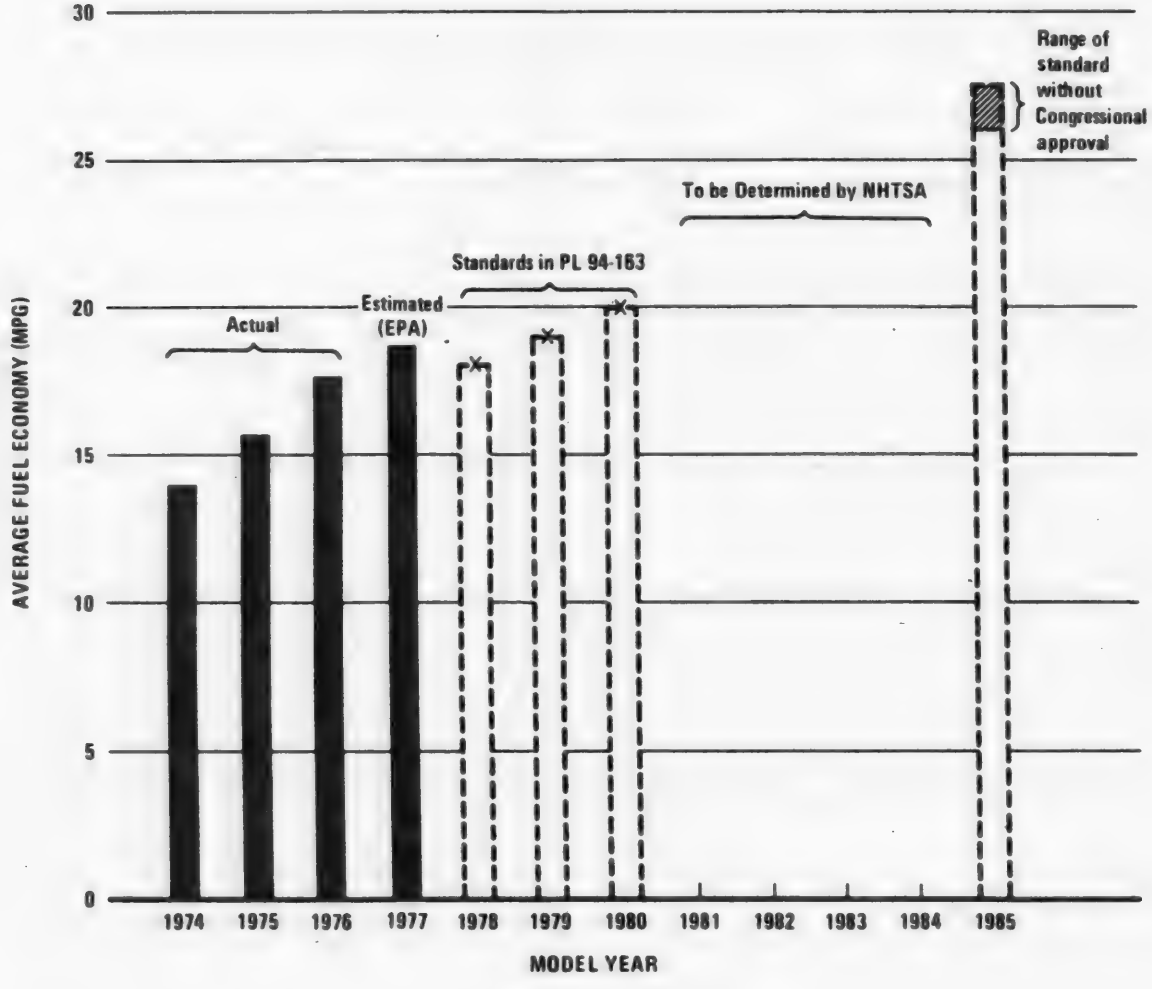


Figure 5

AVERAGE FUEL ECONOMY OF NEW AUTOMOBILES, MODEL YEARS 1974 - 1985
(U.S. Market)



Source: EPA, Office of Mobile Source Air Pollution Control. Summary Chart, September 19, 1975

each model type is to be measured, and fleet average fuel economy of a manufacturer is to be calculated, by procedures established on September 10, 1976, (41 FR 38674) by the Environmental Protection Agency (EPA) Administrator, who is required to report measurements and calculations to the Secretary of Transportation.

The equation used by EPA for computing city/highway combined fuel economy for each new model automobile in a given inertia weight class is:

$$MPG_{c/h} = \frac{1}{\frac{.55}{MPG_c} + \frac{.45}{MPG_h}}$$

Where:

$MPG_{c/h}$ = Combined city/highway fuel economy in miles per gallon.

MPG_c = Miles per gallon obtained on the EPA city driving cycle.

MPG_h = Miles per gallon obtained on the EPA highway driving cycle.

} EPA Composite Driving Cycle

For each manufacturer, the following formula is used to obtain the average fleet fuel economy:

$$MPG = \frac{1}{\sum f_i \left[\frac{1}{MPG_{c/h,\ i}} \right]}$$

Where:

MPG = Fuel economy for the model year (MPG)

f_i = Fraction of sales of model type i.

$MPG_{c/h,\ i}$ = City/highway combined fuel economy for model type i.

For example, if a manufacturer produced only three models with combined fuel economy of 18, 20, and 22 MPG and sales of 30, 20 and 50 percent respectively, the average fuel economy for this manufacturer's fleet in MPG is:

$$MPG = \frac{1}{\frac{0.30}{18\ (MPG)} + \frac{0.20}{20\ (MPG)} + \frac{0.50}{22\ (MPG)}} = 20.2$$

Table 1 shows the trends in the fleet average fuel economy for fourteen manufacturers in MY 1975-1977. Currently, only four automobiles, Fuji, Honda, Toyota, and Volkswagen, meet the 1985 fuel economy goal of 27.5 MPG - and all four are foreign made.

Table 1

FUEL ECONOMY FOR SELECTED MANUFACTURERS, 1975-1977

	1975	1976	1977
American Motors	19.0	18.3	19.2
Chrysler	15.5	16.5	16.6
Ford	13.6	17.3	17.1
General Motors	15.4	16.7	18.4
Audi	24.2	25.2	25.9
BMW	17.7	18.9	20.4
Fuji (Subaru)	26.5	29.7	30.2
Honda	31.3	32.6	35.6
Nissan (Datsun)	24.9	26.9	27.1
Porsche	19.8	20.5	19.8
Toyo Kogyo (Mazda)	16.7	21.9	26.1
Toyota	22.2	25.0	28.1
VW	27.4	28.3	30.4
Volvo	19.2	19.4	19.9
Fleet Average	15.6	17.6	18.6

Source: EPA "Light Duty Automotive Fuel Economy Trends Through 1977," SAE Paper #760795, September 1976.

Section 4

STATUTORY REQUIREMENTS

Sections 501-505 and 508 of the new Title V of the Motor Vehicle Information and Cost Savings Act direct the Secretary of Transportation to issue standards on fuel economy as follows:

(1) Section 501(1), (2) and (3) authorize the Secretary to prescribe rules defining and classifying "automobiles," "passenger automobiles," and "automobiles capable of off-highway operation."

(2) Section 501(8) directs the Secretary to prescribe rules for determining which manufacturer is responsible for compliance with the Act, in cases where there is more than one manufacturer of an automobile.

(3) Section 502(a) (3) requires the promulgation, by rule, of average fuel economy standards for passenger automobiles manufactured in each of the model years 1981 through 1984. The Title provides for the issuance of these standards by July 1, 1977.

(4) Section 502(b) of the Act provides that average fuel economy standards for nonpassenger automobiles be prescribed at least 18 months prior to the beginning of the model year to which they are applicable.

(5) Section 502(c) of the Act authorizes the Secretary to establish the format and content for an application, by a manufacturer who manufactures fewer than 10,000 passenger automobiles in a given model year, for an exemption from the generally applicable average fuel economy standards.

(6) Section 502(d) (1) of the Act requires the Secretary to issue a regulation covering applications by automobile manufacturers for reductions of passenger automobile fuel economy standards for MY 1978, 1979, and 1980.

There is no statutory deadline for issuance of this regulation, but Section 502(d) (1) permits manufacturers to apply for reductions of fuel economy standards at any time within 24 months prior to the beginning of the model year for which the reduction is sought.

(7) Section 503(d) (1) of the Act requires the EPA Administrator to establish fuel economy testing and calculation procedures for both passenger and nonpassenger automobiles, and report measurements and calculations to the Secretary of Transportation. Section 503(d) (3) provides that these procedures will be promulgated at least 12 months prior to the model year to which they are applicable. Section 503(f) requires the EPA Administrator to consult and coordinate with the Secretary in carrying out his duties.

(8) Section 505(a) (1) authorizes the Secretary to establish the format and content of the semiannual compliance reports to be filed by automobile manufacturers. The first report is to be filed during the 30-day period preceding the beginning of the manufacturer's 1978 model year.

(9) Section 508 covers civil penalties to be assessed by the Secretary for compliance violations, and the deduction from these penalties of credits given a manufacturer for achieving average fuel economy in excess of that required under the applicable standard.

Section 5

IMPLEMENTATION

The Secretary of Transportation has assigned the responsibility of implementing the applicable sections of Title V to the Administrator of NHTSA. The organizational structure of NHTSA has been expanded to add the Office of Automotive Fuel Economy, which reports directly to the Administrator (See Appendix A). The elements of the Office are shown in Appendix B. Positions and total dollar resources for the NHTSA fuel economy program for FY 1976TQ and FY 1977 are given in Appendix C.

RULEMAKING

Dockets have been established at NHTSA for all automotive fuel economy rulemaking actions. These files are available for public review. Rulemaking for seven fuel economy standards has been initiated:

1. Development of fuel economy standards for passenger automobiles for model years 1981-1985 and beyond, Docket # FE 76-01.

   Description

   This NPRM proposes a new regulation for specifying average fuel economy standards for passenger automobiles in model years 1981 through 1985 and beyond. An ANPRM was issued to obtain information and comments. Additional notice and opportunity to comment will be provided before the standards are issued.

2. Development of a regulation for applications from industry for reducing passenger automobile fuel economy standards for model years 1978-1980, Docket # FE 76-02.

   Description

   This NPRM proposes a new regulation specifying requirements for submission of petitions from manufacturers for

reducing the passenger automobile average fuel economy standards for model years 1978-1980. Such a reduction would partially offset any loss of fuel economy due to the application in those years of Federal emission, safety, noise, or damageability standards more stringent than those applicable to MY 1975. The NPRM also describes the procedures that NHTSA would follow in acting on the petitions.

The NPRM was published on October 26, 1976: 41 FR 46878

3. Development of standards for nonpassenger automobiles, Docket # FE 76-03.

Description

This NPRM proposes a new average fuel economy standard for nonpassenger automobiles of 6,000 pounds and less, beginning in MY 1979.

The final rule is scheduled for publication in March 1977.

4. Development of a regulation for exemption applications for low-volume automobile manufacturers.

Description

This NPRM proposes a new regulation specifying requirements for submission of petitions from manufacturers of less than 10,000 passenger automobiles per year for an exemption to the average fuel economy standards. Such exemptions may be granted only if NHTSA determines that the standard otherwise applicable is more stringent than the maximum feasible average fuel economy level which the manufacturer can attain. An exemption can be granted for a low-volume manufacturer only if NHTSA establishes

an alternative (maximum feasible level) standard for the manufacturer, or for such classes of automobiles as the manufacturer produces.

Estimated publication date of the final rule is April 15, 1977.

5. Vehicle classification.

Description

This NPRM proposes a new regulation to define automobiles, passenger automobiles, nonpassenger automobiles and automobiles having a significant feature (other than 4-wheel drive) designed to equip them for off-highway operation.

The rule is scheduled for publication by March 1, 1977.

6. Multistage manufacturer responsibility.

Description

This NPRM proposes a new regulation to prescribe rules for determining, in cases where there is more than one manufacturer of an automobile, which manufacturer is responsible for complying with the provisions of Title V.

The rule is scheduled for publication by March 1, 1977.

7. Development of a regulation for automobile manufacturers' reports on fuel economy.

Description

This NPRM proposes the content and format for the semiannual reports that automotive manufacturers are required to submit, beginning with MY 1978. The semiannual reports will contain pertinent information to support the program offices.

The rule is scheduled for publication by August 1977.

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It is anticipated that additional regulations in the following areas will be required in the future:

Procedural

Rule on which vehicles with GVWR greater than 6,000 pounds and less than 10,000 pounds are automobiles.

Passenger Automobiles (MY 1978-1980)

Rule granting or denying reductions of average fuel economy standards applied for by manufacturers.

Rule prescribing procedures for formal compliance determination hearings for 1978 and later model years.

Rule governing carryback and carryover of credits for exceeding the average fuel economy standards in any model year.

Passenger Automobiles (MY 1981-1985)

Rule modifying the average fuel economy standard for MY 1985 passenger automobiles, if necessary.

Rule modifying standards for average fuel economy of MY 1981 to 1984 passenger automobiles, pursuant to modification of the standard for 1985 models, if necessary.

Nonpassenger Automobiles

Rule establishing average fuel economy standards for nonpassenger automobiles between 6,000 and 10,000 pounds GVWR, if required.

Low-Volume Manufacturer Applications

Rule granting or notice denying applications for exemption from average fuel economy standards and establishment of alternative standards.

Manufacturers' Reports and Recordkeeping

Rule prescribing records to be kept and information to be provided by the automobile manufacturers to aid NHTSA in implementing the fuel economy program.

RELATED ACTIVITIES

In connection with the formulation of the rules required under Sections 501-509 and preparation of public notices and reports to the Congress, NHTSA also performs many related activities. Since the passage of the Act, NHTSA has initiated actions to:

1. Establish and maintain appropriate relationships with consumer groups, the automotive industry, and other Federal agencies.

2. Develop and update economic and technological data bases.

3. Modify the automotive fuel economy research programs to incorporate the statutory requirements of Title V.

4. Formulate methods for the collection and reporting of information required to assess manufacturers' technological alternatives and corporate economic capabilities.

5. Set up procedures to ensure compliance with standards.

6. Recommend penalties for manufacturers failing to meet the standards.

7. Assess and evaluate program effectiveness.

EFFECTS OF SAFETY AND DAMAGEABILITY STANDARDS

All FMVSS's and damageability standards which have been issued, or which NHTSA plans to issue through 1980, have been analyzed to determine their effect on the fuel economy of post-MY 1975 automobiles. In this

analysis, it was assumed that any measurable effect on fuel economy could only be caused by an increase in electrical power consumption or an increase in vehicle weight of 10 or more pounds. Previous research indicates that it would be necessary to increase the weight of a small car by 100 pounds to reduce fuel economy by 0.29 MPG.

Analysis of issued standards reveals that only three safety standards and one damageability regulation currently in force may impact post-1975 vehicle weight by more than 10 pounds. No significant effect on electrical power consumption is anticipated. Fuel impacts of standards to be issued after 1980 will be evaluated in the future.

Existing Standards

FMVSS No. 215 - Exterior Protection - Passenger Cars

This standard, effective September 1, 1972, requires MY 1973 passenger cars to withstand barrier impacts of 5 mph front, and 2 1/2 mph rear, without damage to lighting, fuel, exhaust, cooling, and latching systems. An amendment, effective September 1, 1973, was issued to upgrade the barrier impact speed to 5 mph front, and 5 mph rear and to correct the mismatch that exists between passenger car bumpers by requiring impacts by a weighted pendulum at 5 mph front and rear.

Post-MY 1975 automobiles with a wheelbase of 120 inches or more, which were previously exempted from some of the impact requirements, must now meet them. Although this may mean an increase in bumper weight on these luxury cars, NHTSA estimates that the fleet average weight increase for all model years will be less than 10 pounds.

Part 581 - Bumper Standard

On March 4, 1976, NHTSA issued a final rule on Part 581, Bumper Standard. The purpose of this standard is to reduce physical damage to the front and rear ends of a passenger motor vehicle from low-speed collisions. NHTSA is proposing that manufacturers be given the option of complying with either FMVSS No. 215 or Part 581 until September 1, 1978, when compliance with Part 581 becomes mandatory. The new

standard permits the use of "soft face" bumpers as long as the damage to the vehicle does not exceed specified limits. Soft-face bumpers are expected to weigh 110 to 120 pounds, substantially less than many MY 1975 bumpers. NHTSA expects, therefore, that Part 581 requirements will likely result in a weight reduction compared to MY 1975 passenger cars.

FMVSS No. 301 - Fuel Systems Integrity - Passenger Cars

This standard specifies requirements for the integrity and security of fuel tanks, fuel tank filler pipes, and fuel tank connections in all passenger cars manufactured after January 1, 1968. An amendment to this standard upgrades passenger car fuel system performance requirements, effective September 1, 1975, and extends the applicability to multipurpose passenger vehicles, trucks, and buses with a GVWR of 10,000 pounds or less. As of September 1, 1976, it must be demonstrated that fuel loss in these vehicles will not exceed one ounce per minute in a static rollover, a 30-mph moving barrier crash, a 20-mph lateral moving barrier crash, and a 30-mph frontal barrier crash. All of the other vehicles subject to the standard must meet these requirements as of September 1, 1977.

NHTSA expects that the post-MY 1975 passenger car requirements of FMVSS No. 301 can be met with no increase in weight. Even if some manufacturers elect to meet the requirements through shielding rather than redesign, the fleet average weight differential still should be less than 10 pounds.

Planned Standards

Current plans for the period through FY 1978 indicate that NHTSA may issue new rules or amend existing standards in 32 areas which may affect MY 1979 and MY 1980 passenger cars.

While formal impact analyses have not been completed on all of these 32 standards, a preliminary review indicates that only FMVSS No. 108 (Lighting Equipment) and FMVSS No. 208 (Occupant Crash Protection) may possibly affect the fuel economy of pre-MY 1981 passenger automobiles.

FMVSS No. 108 - Lamps, Reflective Devices, and Associated Equipment
(Amendment)

This amendment to FMVSS No. 108 proposes requirements for side-turn signal lamps and high-intensity headlamps. The NPRM is scheduled to be issued in FY 1977, and the rule in FY 1978. Although improvements are being made in reducing the power consumption of vehicle lighting systems, the new side-turn signal lamps and higher-intensity headlamps will draw more power than MY 1976 lamps. However, preliminary analysis indicates that the total increase in fuel consumption will be less than one-half gallon per car per year.

INTRA-AGENCY AND INTERAGENCY COORDINATION

Intra-Agency Review

In delegating responsibility for developing fuel economy standards to the National Highway Traffic Safety Administration (NHTSA), the Office of the Secretary of Transportation (OST) has retained a review and concurrence authority which is exercised through the Assistant Secretary for Systems Development and Technology. As work progresses in developing a fuel economy standard, OST is kept informed and a completed Notice of Proposed Rulemaking (NPRM) or Final Rule (FR) is sent to OST for formal review and concurrence.

The formal review normally takes about one month, during which OST is briefed and specifies any changes required for concurrence.

Interagency Review

Fuel economy regulations proposed by NHTSA are also subject to interagency review, in accordance with an Office of Management and Budget (OMB) memorandum issued on October 5, 1971. This memorandum states that "agency regulations, standards, and guidelines pertaining to environmental quality, consumer protection and the occupational public health and safety" are to be submitted for interagency review 30 days prior to being proposed publicly.

NHTSA determines which agencies are asked to review particular rules and consults with OST and the OMB Transportation Branch if there is any doubt whether an agency should be involved. In addition to the Environmental Protection Agency (EPA), the Federal Energy Administration (FEA), and the Energy Research and Development Administration (ERDA), the agencies to be considered for review include the Department of Commerce, the Council on Environmental Quality (CEQ), the Council on Wage and Price Stability (COWPS), and the Economic Policy Board.

By far the closest involvement is with EPA. This agency is responsible for prescribing, by rule, the testing and calculation procedures and conducting the tests and making the calculations on the basis of which compliance with fuel economy standards is determined by NHTSA. EPA is also consulted on a continuing basis concerning the effects of the emission standards on fuel economy.

The rules issued by NHTSA on fuel economy and several rules promulgated by EPA that relate to fuel economy have been the result of coordination between the two agencies. NHTSA and EPA are continuing to develop more effective methods of cooperation.

Some of the major issues identified during coordination with FEA and EPA are presented in the Research and Development Section.

ERDA provides inputs to NHTSA on the status of advanced engine programs which could impact on the post-1985 fuel economy standards.

Section 6

THE RULEMAKING PROCESS

As a pattern for fuel economy rulemaking, NHTSA has adopted a process similar to that used by the agency in issuing Federal Motor Vehicle Safety Standards (FMVSS's). The most significant modification relates to the period permitted for completing the process. In compliance with the EPCA, the first group of fuel economy rules will be issued in final form by March 1, 1977, fourteen months after the Act was signed into law. To satisfy this schedule, the time allowed for accomplishing rulemaking milestones has had to be drastically reduced, while yet offering interested parties the opportunity to participate in the rulemaking process.

As required by the Administrative Procedures Act and implementing orders, NHTSA allows other Federal agencies, industry, and interested private citizens and groups to comment on fuel economy proposals. From these comments, it is expected that NHTSA will acquire information and opinions that will contribute to the issuance of final rules calculated to best achieve maximum feasible automobile fuel economy.

The fuel economy rulemaking process requires NHTSA to:

(1) Prepare an engineering draft which describes the technical specifics of the proposed rule and the reasons why particular engineering decisions were made.

(2) Prepare a rulemaking support paper (RSP), a preliminary impact assessment (PIA), and a review to determine if a draft environmental impact statement (DEIS) is needed. The RSP provides the technical basis for the PIA and the environmental review. The PIA contains such items as:

(a) Estimates of the cost impact on consumers, producers, or businesses, and on Federal State, or local governments.

(b) Effects on supplies of important materials, energy supply or demand, and automobile performance.

(c) Reasonable and practical alternatives and their impacts.

The environmental review evaluates the need for a DEIS by estimating the primary and secondary environmental effects of fuel economy on existing air, noise, and water pollution standards and on energy supply and natural resources development.

(3) Prepare the legal draft of the rulemaking document. The legal draft describes the nature of the proposal, the purpose of its issuance, the specific information requested or requirements to be satisfied, the expected impact and environmental effects, and the time allowed for comments.

(4) Obtain departmental concurrence.

(5) Conduct interagency coordination.

(6) Transmit the rulemaking document to the Federal Register for publication, for public review and comment.

These activities are in line with the President's goal of comprehensive regulatory reform and ensure that rulemaking proposals are supported by adequate analysis of anticipated costs and consequences before they become final rules.

Table 2 depicts the major steps associated with publication of a typical rule on automotive fuel economy.

Table 2

STEPS IN THE DEVELOPMENT OF AUTOMOTIVE FUEL ECONOMY RULES

1. Engineering Draft of Proposed Rulemaking
2. RSP, PIA, DEIS
3. Legal Draft of NPRM
4. Concurrence of Secretary and Interagency Coordination
5. Publication of NPRM in Federal Register
6. Public Hearings if necessary
7. Incorporation of comments
8. Engineering Draft of Rule
9. Legal Draft of Rule
10. Concurrence of Secretary
11. Interagency Coordination
12. Publication of Rule in Federal Register
13. Post-Rule Activities

Section 7

RESEARCH AND DEVELOPMENT SUPPORT

The NHTSA Automotive Fuel Economy (AFE) program is supported by research and development which contributes to the sound formulation, establishment, and enforcement of fuel economy standards and standards modifications.

The purpose of the AFE R&D support program is to enhance NHTSA's preparedness to (1) address and apply the statutory criteria of Title V of the Motor Vehicle Information and Cost Savings Act, (2) review and assimilate the responses and submissions made by manufacturers, consumers, and other interested parties during the rulemaking process, and (3) report to the Congress the progress made in implementation of Title V.

The objective of the support program is to develop, maintain, and update (1) the data bases (statistical, technological, engineering, manufacturing, cost, financial, economic, marketing, and other national impacts) and (2) the analytical tools (framework, methodologies, and specific approaches) necessary to evaluate the maximum feasible fuel economy level and related rulemaking actions.

In the AFE R&D program, the services of the DOT Transportation Systems Center (TSC) will be used to the maximum possible extent. TSC has the expertise and capability for the identification and acquisition of data and the analtyical techniques necessary to support rulemaking actions. The Center also has extensive experience in establishing a qualified contractor base in virtually all subjects of interest to the AFE program, and in dealing with auto manufacturers and the auto industry for informal exchange of information. It is planned to supplement the services of TSC with selected contracts with the private sector.

Those portions of the Motor Vehicle Goals study* which apply to fuel economy rulemaking will be modified and updated as necessary for use in

* "The Report by the Federal Task Force on Motor Vehicle Goals Beyond 1980." Draft report to the Energy Resources Council (ERC), September 2, 1976.

the AFE R&D support program.

These elements include (a) detailed breakdown of technological and economic information and analyses by manufacturer, (b) explicit inclusion of nonpassenger autos, (c) reformulation of baselines and projected baselines for the determination of impacts from AFE standards and (d) reconsideration of the effects of other Federal standards (emissions, safety, damageability, noise). In addition, existing data bases and analytical tools will be updated periodically.

To maintain administrative control and facilitate program review, the AFE R&D support program is divided into four task areas: (1) Assessment of Technological Options, (2) Industry Assessment, (3) Economics, Marketing, and Other Impacts, and (4) Integrated Evaluations.

Assessment of Technological Options initially refers to the evaluation of production and production-prototype hardware available to manufacturers for achieving fuel economy improvements. This encompasses potential for auto-weight reduction, engine and drivetrain improvements, and also includes the effects of other Federal standards on fuel economy.

Industry Assessment includes evaluation of manufacturability and costs of technological improvements, both individually and in combination, assessment of manufacturers' capabilities and leadtimes in implementing fuel economy improvements, and capital requirements and the feasibility of obtaining capital.

Economics, Marketing and Other Impacts involves such complex factors as the following:

- o Identification and allocation of costs and benefits to the manufacturer and consumer as a result of specific AFE standards.
- o Evaluation of consumer choices and preferences and the resulting impact on the manufacturer's ability to meet AFE standards.
- o Fuel price effects in the absence or presence of AFE standards.
- o Aggregated economic effects of AFE standards on the automotive sector of the economy, on the national economy, on petroleum and other national resources, on air quality, and on highway safety.

Integrated Evaluations consist of tasks devoted to systems integration to generate coherent analysis, evaluation, and documentation in response to specific rulemaking.

Following are the plans in these four areas during FY 1977:

Assessment of Technological Options

(1) Improve and develop tools, (engineering and statistical) to predict fuel economy as a function of performance, emissions, etc., including analysis and tests.

(2) Obtain data on lightweight internal combustion engines (spark ignition and diesel). The emphasis will be on the evaluation of engines that offer the "best" fuel economy for low horsepower-to-vehicle-weight ratios for given emission constraints. Potential costs will be evaluated. The effect of control logic for a number of engine/vehicle configurations will be studied.

(3) Evaluate the impact of advanced transmissions on emissions and fuel economy.

(4) Evaluate the weight-reduction potential of passenger and nonpassenger cars and utility vehicles considering comfort, safety, damageability, reliability, and initial cost. Manufacturing considerations will be included in the study.

(5) Define the performance of mass-produced engines, their efficiency as a function of emission control, and ancillary hardware and software requirements.

Industry Assessment

(1) Expand and improve the automotive manufacturing data base. Under this task, manufacturing cost data and methodology generated by the basic interview method, and consultant estimates for various components and vehicles, will be compared with the costing technique based on teardown of actual components or vehicles in order to verify and calibrate the manufacturing cost data bases.

(2) Collect data and perform analyses of industry capital, labor and material requirements, production scheduling, and costs. Provide responses to specific industry concerns about production capacities, capital availability, changeover intervals and labor. Alternative strategies for meeting capital requirements will also be evaluated.

(3) Assess ease of manufacture (materials, labor, capital requirements and costs) for projected components and vehicles, e.g., innovative structures, conversion to smaller engines and gas-to-diesel engines.

(4) Evaluate engineering risks to the consumer and to the manufacturer associated with design changes that show fuel-economy benefits. Studies will include the investigation of possible degradation in durability and safety due to reduction in body-metal thickness, and increase in engine speed (for smaller engine size) to reduce vehicle weight.

(5) Expand and improve the maintenance cost data base to provide cost information on automotive maintenance inspection and diagnostic equipment. This task will also determine requirements for maintenance of advanced electronic control systems and other components, and provide information on costs to meet damageability standards.

Economics, Marketing and Other Impacts

(1) Develop financial analyses on each major manufacturer to assess his ability to underwrite technical changes which would improve fuel economy and the risks in doing so.

(2) Develop data and methodologies for assessing various strategies (extent and phasing of technolological innovation, production fleet mix, vehicle performance, and pricing) used by manufacturers to meet AFE standards. Determine the effects of such strategies on the consumer.

(3) Develop techniques for assessing consumer response to various alternatives offered by manufacturers in response to AFE standards.

(4) Determine the sensitivity of items such as corporate fuel economy, sales volume, fleet mix and vehicle miles traveled to various increases in fuel price.

Integrated Evaluations

(1) Synthesize information from each of the three major areas above, to determine the impact of proposed standards, for both passenger and nonpassenger automobiles, utilizing techniques similar to those applied in the Motor Vehicle Goals study.

(2) Provide technological, economic, marketing, and societal data bases for proposed AFE standards.

Economic Practicability

Title IIIA of the Energy Policy and Conservation Act, which adds a new Title V to the Motor Vehicle Information and Cost Savings Act, represents a new area of governmental regulatory activity, the regulation of automotive fuel economy. Heretofore fuel economy of automobiles has been left to market forces; now it is to be determined, at least in part, by governmental action. The purpose of the new regulatory program is to help ensure that scarce crude oil resources are used in ways which reflect the high economic costs incurred to make these resources available and the risks resulting from increasing U. S. dependence on imports from countries which have restricted the availability of crude oil to the United States.

The overriding objective of this program is to conserve fuel. In setting fuel economy standards the NHTSA Administrator is required to consider their economic practicability. The Congress has demonstrated an awareness that adverse economic effects could result from setting standards too high. To avoid these economic consequences, the Title

requires the Administrator to consider the economic practicability as well as the technological feasibility of establishing and implementing particular standards.

In addition to mandating fuel economy, the Act empowers the FEA to keep fuel prices below the levels that would exist in a normal market. Provision for government price controls on petroleum in the same legislation which seeks to conserve fuel may seem contradictory. Allowing the price of fuel to rise is one way to encourage conservation. Congressional rationale may rest on the following suppositions:

(1) As a result of actions by foreign suppliers, fuel prices under free market conditions have become so high that the American people should be protected against them.

(2) These high prices would result in unjustifiable gains to some American producers who could sell at prices which do not reflect the historical costs incurred in finding and producing oil.

For these reasons the price of crude oil to petroleum refiners is set at less than normal market clearing levels and, consequently, the price of gasoline to motorists is below the levels that would exist under free market conditions. Thus, without the fuel savings provisions of the EPCA, Americans would use fuel at greater rates than is justified by real costs or scarcity and would purchase automobiles that are comparatively fuel inefficient.

Congress did not provide a definition of the term "economic practicability." The Administrator is allowed considerable discretion in interpretation of the term. Two ways of approaching the concept of economic practicability are discussed below.

The first approach relies primarily on the premise that current fuel prices cannot be used as a guide for the scarcity of petroleum products. These prices are depressed by government control actions and to adequately measure the value of petroleum, the current world price must include the cost of supply interruptions. Under this interpretation, the Administrator should mandate fuel economy standards

which reflect a higher fuel price than now exists. The Administrator might also conclude that the risk of supply interruption is such as to cause a still higher "price" of fuel to be used as a guide to fuel scarcity. This conclusion would call for more stringent fuel economy measures.

The legislatively set goal of 27.5 MPG implies an as yet indeterminate fuel price. There is a price of gasoline at which the automobile fleets produced and sold in the United States would have this average fuel economy. The Administrator may reduce the minimum average fuel economy requirement from 27.5 to 26 MPG without Congressional review, if he determines that this reduction is the maximum feasible level of average fuel economy. In the absence of the EPCA fuel economy measures, 26 MPG fuel economy would be achieved by market forces at a somewhat lower fuel price than that necessary to achieve 27.5 MPG.

At this time we do not know whether the gasoline prices at which either 26 or 27.5 MPG would be achieved by market forces are near, above, or below those which would result from oil at world market prices. NHTSA's research program has as one of its goals the determination of the relationship between fuel prices and fuel economy of automobiles produced for the United States market.

It is anticipated that this research will provide answers to the following questions:

(1) What gasoline price would ultimately result in the production and sale of automobiles that would average 26 or 27.5 MPG?

(2) What would be the average fuel economy of automobiles if there were no fuel economy regulatory program and if gasoline prices were decontrolled to reflect world crude oil prices? How would the average fuel economy change if a premium were added to these prices to reflect the risks of interruption of the supply of crude oil?

A second approach of economic practicability is that the economic consequences of achieving various fuel efficiency levels must fall within acceptable ranges. The following impacts of fuel economy standards may be considered:

(1) The effect on prices of automobiles, and hence on their marketability and the consequent impact on fuel savings.

(2) The effect on the characteristics (e.g., size, capacity and performance) of automobiles and therefore on their marketability.

(3) The effect on employment in the automobile manufacturing and related industries.

(4) The effect on competition and on the economic health of firms in the automobile manufacturing and related industries.

(5) The effect on the amount of energy necessary to manufacture automobiles and their components as compared to the resultant effect on fuel consumption.

NHTSA's research program will investigate the two interpretations of economic practicability described above. The research will not determine economic practicability. That will be a matter in which the Department of Transportation and the Congress will exercise judgment.

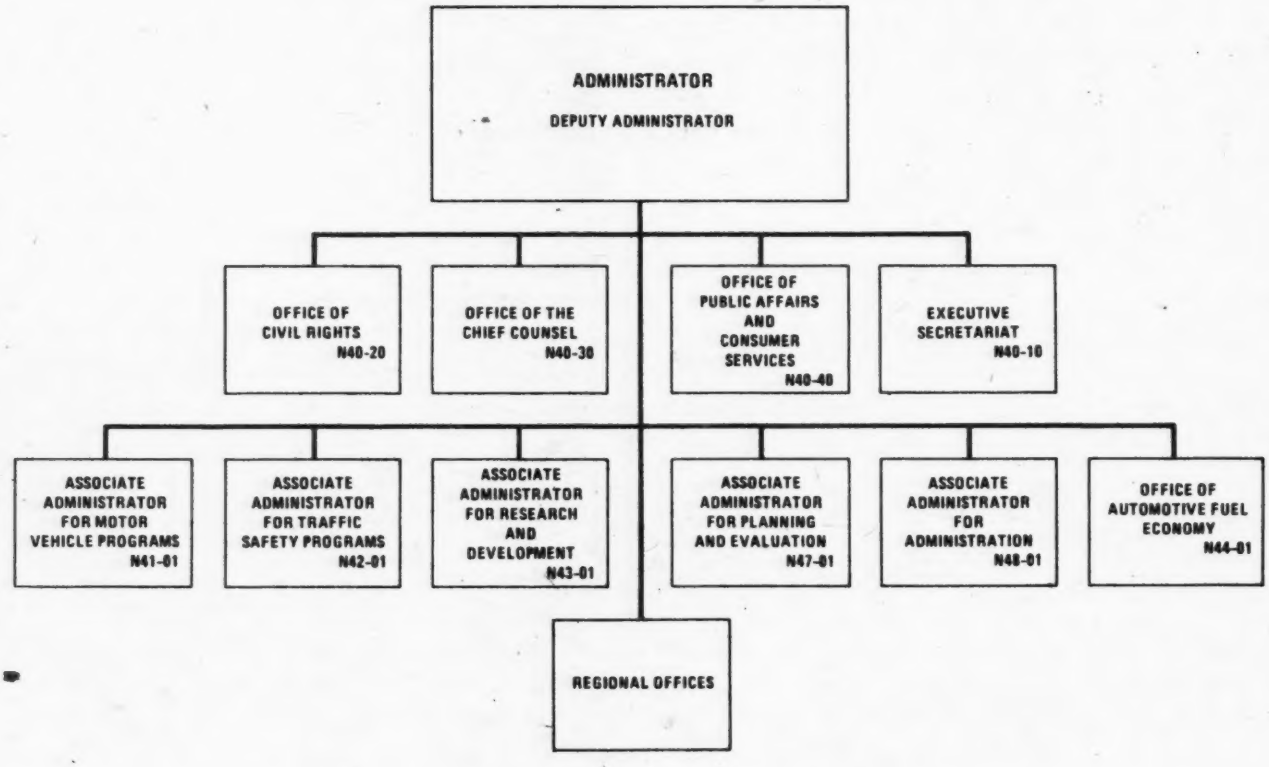
GLOSSARY

AFE	Automotive Fuel Economy
ANPRM	Advance Notice of Proposed Rulemaking
CEQ	Council on Environmental Quality
COWPS	Council on Wage and Price Stability
DEIS	Draft Environmental Impact Statement
DOT	Department of Transportation
EPA	Environmental Protection Agency
EPCA	Energy Policy and Conservation Act
ERC	Energy Resources Council
ERDA	Energy Research and Development Administration
FE	Fuel Economy
FEA	Federal Energy Administration
FHWA	Federal Highway Administration
FMVSS	Federal Motor Vehicle Safety Standard
FR	Federal Register
FTC	Federal Trade Commission
GSA	General Services Administration
GVWR	Gross Vehicle Weight Rating

MPG	Miles Per Gallon
MY	Model Year
NHTSA	National Highway Traffic Safety Administration
NPRM	Notice of Proposed Rulemaking
PIA	Preliminary Impact Assessment
PL	Public Law
RSP	Rulemaking Support Paper
TQ	Transition Quarter
TSC	Transportation Systems Center

APPENDIX A

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION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EXECUTIVE SECRETARIAT N40-10
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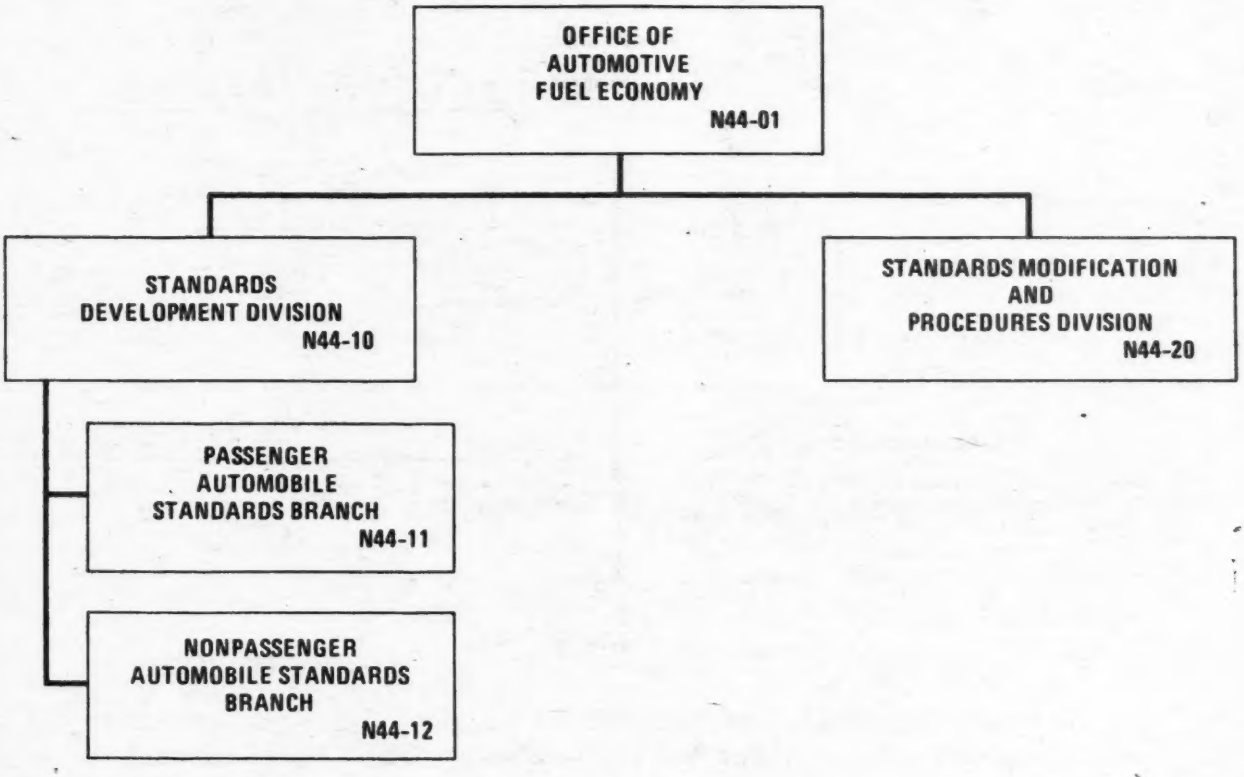
REGIONAL OFFICES

APPENDIX B

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
Office Of Automotive Fuel Economy



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APPENDIX C

AUTOMOTIVE FUEL ECCNOMY PROGRAM

(Dollar amounts in thousands)

	FY 1976 TQ	FY 1977*
Positions	-	40
Dollars:		
Salaries and supporting expenses	-	900
Contract program		$2,100
TOTAL	$1,405	$3,000

*An additional $3.0 million will be requested in a supplemental appropriation request and $2.0 million will be added through internal reprogramming.

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